

**Shawn Bowers**

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Ph.D. Candidate

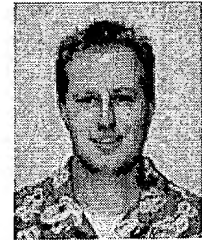
Department of Computer Science

Database and Object Technology Lab

OGI School of Science and Engineering at Oregon Health &amp; Science University

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Phone: (503)748-7068

B.S., Computer Science, University of Oregon, 1998

My research interests are in the area database systems, and specifically, I am intrested in the representational capabilities of data models, data interoperability, and techniques for schema and data transformation. As a graduate student, I have worked with Prof. Lois Delcambre and Prof. David Maier on the Forest, Footprints, Autonomix, and Heterodyne projects.

**Papers and Presentations:**

- **The Uni-Level Description: A uniform framework for representing information in multiple data models.**  
Shawn Bowers and Lois Delcambre Submitted for publication, March, 2003. (.pdf)
- **Incremental Navigation for Exploring Structured Information.**  
Shawn Bowers and Lois Delcambre  
Submitted for publication, December, 2002. (.pdf)
- **Superimposed Schematics: Introducing E-R Structure for *In-Situ* Information Selections**  
Shawn Bowers, Lois Delcambre, and David Maier  
In *Proc. of the 21st International Conference on Conceptual Modeling (ER-2002)*, Tampere, Finland, October 2002. (.ps)
- **JustBrowsing: A Generic API for Exploring Information**  
Shawn Bowers and Lois Delcambre  
Demo at the *21st International Conference on Conceptual Modeling (ER-2002)*, Tampere, Finland, October 2002. (.ps)
- **On Modeling Conformance for Flexible Transformation over Data Models**  
Shawn Bowers and Lois Delcambre.  
In *Proc. of the Workshop on Knowledge Transformation for the Semantic Web at the 15th European Conference on Artificial Intelligence (KTSW-2002)*, Lyon, France, July 23rd, 2002. (.pdf)
- **A Generic Representation for Exploiting Model-Based Information**  
Shawn Bowers and Lois Delcambre.  
In *Electronic Transactions of Artificial Intelligence (ETAI Journal)*, Volume 5, Section D, pp. 1-34, 2001. (<http://www.etaij.org>)
- **Bundles in Captivity: An Application of Superimposed Information**  
Lois Delcambre, David Maier, Shawn Bowers, Longxing Deng, and Mathew Weaver.  
In *Proc. of the IEEE International Conference on Data Engineering (ICDE)*, Heidelberg,

Germany, April 2001. (.pdf)

- **Bundles: Meeting Clinical Information Needs.**

Joan Ash, Paul Gorman, Mary Lavelle, Jason Lyman, Lois Delcambre, David Maier, Shawn Bowers, and Mathew Weaver.

In *Bulletin of the Medical Library Association* (BMLA), volume 89, number 3, 2001.

- **Representing and Transforming Model-Based Information** (.pdf), Shawn Bowers and Lois Delcambre.

In *Proc. of the International Workshop on the Semantic Web at the 4th European Conference on Research and Advanced Technology for Digital Libraries* (SemWeb), Lisbon, Portugal, September, 2000.

- **A Generic Approach for Representing Model-Based Superimposed Information.** Shawn Bowers and Lois Delcambre.

Oregon Graduate Institute Technical Report CSE-00-008. Research Proficiency Exam, May 2000.

- **Applying Adaptation Spaces to Support Quality of Service and Survivability**

Shawn Bowers, Lois Delcambre, David Maier, Crispin Cowan, Perry Wagle, Dylan McNamee, Anne-Francoise Le Meur, and Heather Hinton.

In *Proc. of the DARPA Information Survivability Conference and Exposition*, January 2000.

- **SAM: Security Adaptation Manager**

Heather Hinton, Crispin Cowan, Lois Delcambre, and Shawn Bowers.

In *Proc. of the Annual Computer Security Applications Conference* (ACSAC), Phoenix, Arizona, December 1999.

### Teaching:

- CST 426 Intro. to Artificial Intelligence: Oregon Institute of Technology (OIT), Winter 2003
- CSE 514D Intro. to Database Systems: On-line Course OGI, Fall 2002, Spring 2003.
- CSE 514 Intro. to Database Systems: OGI, Summer 2001, Summer 2002.
- CS 444/544 Intro. to Database Systems: Portland State University, Fall 2001.

### Teaching Assistant for:

- CSE 500 Introduction to Software Engineering
- CSE 504 Object-Oriented Analysis and Design
- CSE 513 Introduction to Operating Systems
- CSE 542 Object Data Management

### Courses taken:

- CSE 580 Principles of Database Systems
- CSE 504 Object-Oriented Analysis and Design
- CSE 509 Object-Oriented Programming
- CSE 511 Principles of Compiler Design
- CSE 532 Analysis and Design of Algorithms
- CSE 533 Automata and Formal Languages
- CSE 542 Object-Oriented Database Systems
- CSE 560 Artificial Intelligence
- CSE 564 Human-Computer Interaction

- CSE 569 Scholarship Skills
- CSE 581 Building Software Systems with Components (taught by M. Morriesey)
- OMSE 521 Using Metrics and Models to Support Qualitative Decision Making
- OMSE 511 Managing Software Development

Vitae ([.pdf](#))





## Lois M.L. Delcambre, Ph.D.

Professor, Department of Computer Science & Engineering, OGI School of Science and Engineering, OHSU

Associate Chair for Computer Science Education, Computer Science & Engineering Department

Phone: 503 748-1689

E-mail: [imd@cse.ogi.edu](mailto:imd@cse.ogi.edu)

Ph.D., Computer Science, University of Louisiana, Lafayette, 1982

PSU Class - CS 386 Introduction to Database Systems - [slides](#) for class on May 18

Reading assignment in the textbook by Ramakrishnan and Gehrke: Ch. 19, Sections 19.1, 19.2, 19.4, (19.5 is optional), 19.6

### Project Links

- [Forest project](#)
- [Footprints project](#)

### Research Interests

#### Database Data Models

Lois Delcambre has worked on object-oriented and other database data models with an emphasis on the structural aspects of the model. The database structure reflected in the class hierarchy is semantically much richer than traditional database models. Her work in this area (with S. Urban) includes constraint analysis to generate algorithmically and process the set of constraints implied by the application schema, plus additional application constraints expressed in a constraint language. This analysis assists the application designer with constraint formulation, schema design and transaction design. Further work in this area (with B. Lim) has led to the characterization of constraints appropriate for constraint analysis, termed object-centered constraints, and has considered the use of the basic algorithm for constraint enforcement.

Work on the class construction primitives in a semantic data model (with K. Davis) has led to the

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development of the Class Model and the associated Class Algebra, a closed, class-forming algebra that includes the object-oriented equivalent of the relational algebra operations. One of the contributions of this work is a set of sound and complete rules of inference for inferring structural relationships in an application schema. The Classifier identifies all structurally inconsistent classes and all isa relationships implied by the current schema.

More recent work (with S. Bowers) has resulted in the definition of the Uni-level description (ULD), a uniform, generic representation for a wide range of structural models that can accommodate multiple levels of schema and missing schemas. The ULD permits the use of powerful transformation rules and navigation capabilities across a range of data models.

Lois Delcambre has also been exploring models for terms or keywords that are used in a digital library (with M. Weaver). The Metadata++ model includes broader/narrower term, synonym, and general association relationships but differs from classical thesarus in that there is no notion of preferred term and terms are allowed to participate in multiple locations in the broader/narrower term hierarchy.

### Selected Recent Publications (books, journals, and chapters in books)

"On modeling conformance for flexible transformation over data models," S. Bowers, L. Delcambre, in Knowledge Transformation for the Semantic Web, Volume 95 of the Frontiers in Artificial Intelligence and Applications Series, IOS Press, Amsterdam, 2003.

"Harvesting Information to Sustain Forests," L. Delcambre, T. Tolle, et al., Comm. of the ACM, 46 (1), January 2003, pp. 38-39.

"A Generic Representation for Exploiting Model-Based Information," S. Bowers, L. Delcambre, E&AI Journal, March, 2002, Linköping Electronic Articles in Computer and Information Science, ISSN 1401-9841, Vol. 6(2001): nr 006, .

"Bundles: meeting clinical information needs," J.S. Ash, P.N. Gorman, M. Lavelle, J. Lyman, L. Delcambre, D. Maier, Bulletin of the Medical Library Association 2001;89(3):294-6.  
Abstract: <http://www.allcnpress.com/mla/89-3.html>

"Following Experts at Work in their Own Information Spaces: Using Observational Methods to Develop Tools for the Digital Library," P. Gorman, M. Lavelle, L. Delcambre, D. Maier, Journal of the American Society of Information Science and Technology 2001 (in press).  
Abstract: <http://www.asis.org/Publications/JASIS/vol53n14.html>

"A Behaviorally Driven Approach to Object-Oriented Analysis and Design with Object-Oriented Data Modeling," L. Delcambre, and E. Ecklund, chapter in Object-Oriented Data Modeling, M.

Papazoglou, S. Spaccapietra, and Z. Tari (editors), MIT Press, 2000, pp. 21-40  
 Abstract: <http://mitpress.mit.edu/catalog/item/default.asp?tttype=2&tid=4075>

"Bundles in the wild: Managing information to solve problems and maintain situation awareness," P. Gorman, J. Ash, M. Lavelle, J. Lyman, L. Delcambre, D. Maier, Library Trends 2000;49(2):266-289.  
 Abstract: [http://alexia.lis.uiuc.edu/puboff/catalog/trends/49\\_2abs.html#gorman](http://alexia.lis.uiuc.edu/puboff/catalog/trends/49_2abs.html#gorman)

"Models for Superimposed Information." With D. Maier, Workshop on Conceptual Models for the WWW in conjunction with the International Conference on Conceptual Modeling, (ER '99), November, 1999, Paris, France, Lecture Notes in Computer Science 1727, Springer Verlag, 1999, pp 264-280.

"Breaking the Database out of the Box: Models for Superimposed Information," L. Delcambre, chapter in Conceptual Modeling: Current Issues and Future Directions, P. Chen, J. Akoka, H. Kangassalo, and B. Thalheim (editors), Lecture Notes in Computer Science, No. 1565, Springer-Verlag, 1999.  
 Abstract: <http://www.springerlink.com/app/home/main.asp?wasp=pe669ui0qn5vqvabhj3>

**Selected Recent Publications**  
 (refereed conferences)

"Superimposing Spatial Enrichments in Traditional Information", Lois Delcambre, David Maier, Mathew Weaver, Leonard Shapiro, Judith Bayard Cushing, International Workshop on Next Generation Geospatial Information, Cambridge (Boston), Massachusetts. October 2003.

"The Uni-Level Description: A Uniform Framework for Representing Information in Multiple Data Models," Shawn Bowers and Lois Delcambre, Proc. of the 22nd International Conference on Conceptual Modeling (ER 2003), Chicago, Illinois, October 2003.

"A Digital GeoLibrary: Integrating Keywords And Place Names," Mathew Weaver, Lois Delcambre, Leonard Shapiro, Jason Brewster, Afrem Gutema and Timothy Tolle, Proc. of the 7th European Conference on Research and Advanced Technology for Digital Libraries (ECDL 2003), Trondheim, Norway, August 2003, Lecture Notes in Computer Science, Number 2769, Traugott Koch, Ingeborg Torvick Solvberg (editors), Springer-Verlag, Berlin, 2003.

"Superimposed Schematics: Introducing E-R Structure for In-Situ Information Selections," Shawn Bowers, Lois Delcambre, David Maier, Proc. of the 21st Int'l Conf. on Conceptual Modeling (ER 2002), Lecture Notes in Computer Science 2503, S. Spaccapietra, S. March, Y. Kambayashi, (eds.), Springer-Verlag, 2002, pp. 90-104.

"G-Metadatat++: Rich Keyword Search Enhanced with a GIS", L. Shapiro, L. Delcambre, T. Tolle,

<http://www.cse.ogi.edu/~lmd/>

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M. Weaver, D. Maier, D. Guenther, J. Brewster, A. Gutema, Proceedings of GIScience 2002, Boulder CO, September 25-28, 2002.

"On Modeling Conformance for Flexible Transformation over Data Models," Shawn Bowers and Lois Delcambre. In Proc. of the Workshop on Knowledge Transformation for the Semantic Web at the 15th European Conference on Artificial Intelligence (KTSW-2002), pp. 19-26, Lyon, France, July 2002.

"Spatial Data Infrastructure for Ecological Research," Judith Bayard Cushing, Nalini Nadkarni, Lois Delcambre, David Maier, Proc. of the National Conference on Digital Government Research, May 2002, Los Angeles, CA, pp. 157-160.

"A Superimposed Architecture for Enhanced Metadata", Mathew Weaver, Lois Delcambre, David Maier, DELOS Workshop on Interoperability in Digital Libraries, held in conjunction with European Conference on Digital Libraries (ECDL 2001), Darmstadt, Germany, Sept. 2001.

"Bundles in Captivity: An Application of Superimposed Information," Lois Delcambre, David Maier, Shawn Bowers, Mathew Weaver, Longxing Deng, Paul Gorman, Joan Ash, Mary Lavelle, Jason A. Lyman, Proc. of the 17th International Conference on Data Engineering, Heidelberg, Germany, April 2001, pp. 111-120.

"Representing and Transforming Model-Based Information," Shawn Bowers and Lois Delcambre, Proc. of the Semantic Web Workshop 2000, held in conjunction with the European Conference on Digital Libraries (ECDL 2000), Lisbon, Portugal, September 2000, pp. 5-18.

"SAM: Security Adaptation Manager," Heather M. Hinton, Crispin Cowan, Lois Delcambre, Shawn Bowers, in Proc. of the Annual Computer Security Applications Conference (ACSAC), Phoenix, AZ, Dec. 1999.

"Superimposed Information for the Internet." With D. Maier, WebDB Workshop Proceedings 1999: 1-9

**Recent Awards and Honors:**

Editorial Board Member, Journal of Data Semantics (Lecture Notes in Computer Science subtitle), Springer-Verlag, 2002-present.

2002 Computer Science and Engineering Department, Outstanding Teacher, OGI School of Science and Engineering, OHSU.

<http://www.cse.ogi.edu/~lmd/>

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**Departmental and  
Institutional Service:**

2001 Recipient of the Oregon Graduate Institute Faculty Award for Outreach.

1999 Computer Science and Engineering Department, Outstanding Teacher, Oregon Graduate Institute.

Co-Project Leader, OGI School Web Development Project, with Jeff Schilling. Co-leading the effort to interview constituents across the OGI school, interview web vendors, select I-Site Design, and serve as the primary leads for the project work in conjunction with I-Site Design.

2000 Developed CSE514D, a distance learning version of CSE514 Introduction to Database Systems, in conjunction with Cenquest, Inc.

Member of the Institute Strategic Planning Committee 1998-1999.

Awarded the Oregon Graduate Institute Outstanding Teaching Award (one of ten awardees), with a cash award of \$1500, 1997.

Member of the accreditation team for OGI representing the Computer Science and Engineering Department, Nov. 1997 - Nov. 1998. OGI was accredited with a number of acclamations in December 1998.

**Recent Professional  
Service:**

Program Chair, dg.o 2004, The Digital Government Conference, The National Conference on Digital Government Research, Sponsored by the National Science Foundation, May 2004.

Panel Organizer and Moderator, "Conceptual Modeling for GIS," International Conference on Conceptual Modeling (ER 2003), Chicago, Illinois, Oct. 2003.

Program Committee Member, International Conference on Conceptual Modeling (ER 2003), 2003.

Proceedings Chair, Joint Conference on Digital Libraries, 2003.

Program Committee Member, Joint Conference on Digital Libraries, 2003.

Program Committee Member, ACM SIGMOD Conference, 2003.

NSF Site Review Team, Engineering Research Center Program, 2003.

Organizer (with Paul Gorman and David Maier), DL12 PI Meeting, July 2002, Portland, Oregon.

<http://www.cse.ogi.edu/~lmd/>

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Posters Chair and Program Committee Participant, Joint Conference on Digital Libraries, 2002.

Program Committee Member, International Conference on Data Engineering, 2002.

NSF Review Panel, Winter 2002.

NSF Site Review Team, Engineering Research Center Program, 2002.

NSF Site Review Team, Engineering Research Center Program, 2000.

Review Team Member, Laboratory Review, Pacific Northwest National Laboratory, a Department of Energy, Multi-Program National Laboratory, September 1999.

Addison-Wesley, Reviewer of Books and Book Proposals in the field of object-oriented analysis and design, including use case modeling.

[Lois M.L. Delcambre <lmd@cse.ogi.edu>](mailto:Lois.M.L.Delcambre~lmd@cse.ogi.edu) • [CSE Department Homepage](#)



Università degli studi di Roma Tre

Facoltà di Ingegneria

Dipartimento di Informatica e Automazione



Riccardo Torlone

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## Research group

Databases and Information Systems

## Research interests

Database theory, conceptual design, active databases, data warehousing and OLAP, Web based information systems, XML data management.

## Research activity

- Recent publications
- List of publications at the University of Trier Computer Science Bibliography

## Teaching

- Basi di Dati (nuovo ordinamento)
- Calcolatori Elettronici
- Sistemi di Elaborazione
- Progetto di Sistemi Informatici
- Sistemi informativi (primo modulo)
- Offerte di tesi di laurea

## Books

- Database Systems: Concepts, Languages and Architectures. McGraw Hill.
- Basi di Dati: Concetti, Linguaggi ed Architetture. McGraw Hill Italia. (In italian.)
- Basi di Dati: Progetti ed Esercizi Svolti. Pitagora Editore. (In italian.)

## Events and services

- EDBT Summer school 2004 (Local organizer and SC member)
- CAiSE 2003 (PC member)
- DSE 2003 (PC member)
- WAIM 2003 (PC member)
- DAWAK 2003 (PC member)
- DMDW 2003 (PC member)
- WISE 2003 (PC member)
- SEBD 2003 (PC member)
- EDBT 2002 (PC member)
- DMDW 2002 (PC member)
- VLDB 2001 (Publicity chair and PC member)

## Further activities

- DBItaly mailing list
- DIA Laboratories

## Hobbies

- All sports. In particular, Skiing and Handball.
- Fine arts. In particular, the paintings of Botticelli and the sculptures of Bernini.
- Movies.

## Office Hours

Friday, 11.00-13.00.

## Contact Information

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**- mercoledì 9/06/2004 ore 9:30-11:00**

(per conferme, questioni urgenti o esigenze specifiche: [atzeni@dia.uniroma3.it](mailto:atzeni@dia.uniroma3.it))

How to reach our department

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**DIDATTICA** (in Italian)

**RESEARCH** (in inglese)

**Database textbook** (in English) -- **Libri di testo sulle basi di dati** (in italiano)

**Pictures** of my previous and current major experimental projects

**Common errors** on my name and affiliation

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Ultima modifica 7 giugno 2004 - Paolo Atzeni

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## Paolo Atzeni , Publications

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**A Bibliography:** List of most of my publications from the Bibliography Server at the University of Trier.

### Books:

- P. Atzeni, S. Ceri, S. Paraboschi, R. Torlone. *Database Systems: concepts, languages and architectures* McGraw-Hill, 1999.
- P. Atzeni, S. Ceri, S. Paraboschi, R. Torlone. *Basi di dati: concetti, linguaggi e architetture seconda edizione*. McGraw-Hill Italia, 1999.
- P. Atzeni, P., A. Mendelzon, G. Mecca, eds. *The World Wide Web and Databases* (International Workshop WebDB'98, Valencia, Spain, March 27- 28, 1998 Selected Papers). Lecture Notes in Computer Science, Vol.1590. Springer-Verlag, 1999.
- P. Atzeni, S. Ceri, S. Paraboschi, R. Torlone. *Basi di dati: concetti, linguaggi e architetture* McGraw-Hill Italia, 1996.
- P. Atzeni, V. Tannen, eds. *Database Programming Languages (Proceedings of the Fifth International Workshop)*. Workshops in Computing, Springer-Verlag, 1996. electronic version from Springer-Verlag
- P. Atzeni and V. DeAntonellis. *Relational Database Theory*. Benjamin and Cummings Publ. Co., Menlo Park, California, 1993.
- P. Atzeni, ed. *LOGIDATA+: Deductive Databases with Complex Objects* Lecture Notes in Computer Science 701. Spriger Verlag, 1993.
- G. Ausiello, P. Atzeni, eds. *ICDT'86, International Conference on Database Theory*, Rome, Italy, September 8-10, 1986, Proceedings. Lecture Notes in Computer Science, Vol. 243, Springer, 1986, ISBN 3-540-17187-8.

### On-line publications and documents available (arranged by topic):

#### Papers on Databases and the Web

See the publication page of the Araneus project; also:

- P. Atzeni. *Databases and the World Wide Web*. In: *SOFSEM'99, Theory and Practice of Informatics* Lecture Notes in Computer Science 1725, Springer-Verlag, 1999, pages 147-159.
- P. Atzeni. *Web Sites Need Models and Schemes*. In: *Conceptual Modeling - ER '98, 17th International Conference on Conceptual Modeling*, Singapore, November 16-19, 1998, Lecture Notes in Computer Science, Vol. 1507, pages 165-167.

#### ISALOG

- P. Atzeni, L. Cabibbo, and G. Mecca. *IsaLog: A Deductive Language with Negation for Complex-Object Databases with Hierarchies*. - Technical Report n.13-96 - Dipartimento di Informatica e Automazione, Universita' di Roma Tre, 1996 - Later appeared in *Data and Knowledge Engineering* 24(1): 1-38 (1997)
  - ps file (of a preliminary version) 350 KBytes

## MDM (Multiple-Data-Model)

- P. Atzeni, R. Torlone. *Management of Multiple Models in an Extensible Database Design Tool*. In *Fifth International Conference on Extending Database Technology (EDBT 96)*, Avignon, France, Lecture Notes in Computer Science, Springer-Verlag, 1996.
  - [gzip file](#) 112 KBytes
- P. Atzeni, R. Torlone. *Schema Translation between Heterogeneous Data Models in a Lattice Framework*. In *Sixth IFIP TC-2 Working Conference on Data Semantics (DS-6)*, Atlanta, Georgia, 1995, Chapman Hall, 1997.
  - [gzip file](#) 115 KBytes
- P. Atzeni and Riccardo Torlone. *MDM: a Multiple-Data-Model Tool for the Management of Heterogeneous Database Schemes* Handout material for the TMR Seminar on Metamodeling, Paris, November 1996.
  - Part I [gzip file](#) 40 KBytes
  - Part II [gzip file](#) 117 KBytes
- P. Atzeni and Riccardo Torlone. *MDM: a Multiple-Data-Model Tool for the Management of Heterogeneous Database Schemes* *Proceedings of the ACM Sigmod International Conference, Exhibition Section*, 1997.
  - [gzip file](#) 67 KBytes

## Database Cooperation

- P. Atzeni, L. Cabibbo and G. Mecca). *Database cooperation: classification and middleware tools*. *Journal of Database Management*, 2000. [pdf file](#) 407 KBytes
- P. Atzeni (in cooperation with L. Cabibbo and G. Mecca). *Database cooperation: classification and middleware tools* Handout material for the tutorial to be presented at CAiSE\*97, Ninth Conference on Advanced Information Systems Engineering.
  - [gzip file](#) 161 KBytes

Previous version presented at ER'96, Fifteenth Int. Conf. on Conceptual Modeling, Cottbus, Germany, 1996.

- [gzip file](#) 149 KBytes



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**Dipartimento di Informatica e Automazione**  
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## MDM: a multiple-data model tool for the management of heterogeneous database schemes

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**Authors** [Paolo Atzeni](#)  
[Riccardo Torlone](#)

**Sponsor** [SIGMOD](#): ACM Special Interest Group on Management of Data

**Publisher** ACM Press New York, NY, USA

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### ↑ ABSTRACT

MDM is a tool that enables the users to define schemes of different data models and to perform translations of schemes from one model to another. These functionalities can be at the basis of a customizable and integrated CASE environment supporting the analysis and design of information systems. MDM has two main components: the Model Manager and the Schema Manager. The Model Manager supports a specialized user, the model engineer, in the definition of a variety of models, on the basis of a limited set of metaconstructs covering almost all known conceptual models. The Schema Manager allows designers to create and modify schemes over the defined models, and to generate at each time a translation of a scheme into any of the data models currently available. Translations between models are automatically derived, at definition time, by combining a predefined set of elementary transformations, which implement the standard translations between simple combinations of constructs.

### ↑ REFERENCES

Note: OCR errors may be found in this Reference List extracted from the full text article. ACM has opted to expose the complete List rather than only correct and linked references.

1 P. Atzeni, G. Ausiello, C. Batini, and M. Moscarini. Inclusion and equivalence between relational database schemata. Theoretical Computer Science, 19(2):267-285, 1982.

- 2 [Paolo Atzeni , Riccardo Torlone, A metamodel approach for the management of multiple models and the translation of schemes, Information Systems, v.18 n.6, p.349-362, Sept. 1993](#)
- 3 [Paolo Atzeni , Riccardo Torlone, Schema Translation between Heterogeneous Data Models in a Lattice Framework, Proceedings of the Sixth IFIP TC-2 Working Conference on Data Semantics: Database Applications Semantics, p.345-364, May 30-June 02, 1995](#)
- 4 [Paolo Atzeni , Riccardo Torlone, Management of Multiple Models in an Extensible Database Design Tool, Proceedings of the 5th International Conference on Extending Database Technology: Advances in Database Technology, p.79-95, March 25-29, 1996](#)
- 5 [Carlo Batini , Stefano Ceri , Shamkant B. Navathe, Conceptual database design: an Entity-relationship approach, Benjamin-Cummings Publishing Co., Inc., Redwood City, CA, 1991](#)
- 6 [Peter Pin-Shan Chen, The entity-relationship model—toward a unified view of data, ACM Transactions on Database Systems \(TODS\), v.1 n.1, p.9-36, March 1976](#)
- 7 [Richard Hull, Relative information capacity of simple relational database schemata, SIAM Journal on Computing, v.15 n.3, p.856-886, August 1986](#)
- 8 [Richard Hull , Roger King, Semantic database modeling: survey, applications, and research issues, ACM Computing Surveys \(CSUR\), v.19 n.3, p.201-260, Sept. 1987](#)
- 9 [Leonid A. Kalinichenko, Methods and tools for equivalent data model mapping construction, Proceedings of the international conference on extending database technology on Advances in database technology, p.92-119, March 1990, Venice, Italy](#)
- 10 [Y. Edmund Lien, On the Equivalence of Database Models, Journal of the ACM \(JACM\), v.29 n.2, p.333-362, April 1982](#)
- 11 [Renée J. Miller , Yannis E. Ioannidis , Raghu Ramakrishnan, The Use of Information Capacity in Schema Integration and Translation, Proceedings of the 19th International Conference on Very Large Data Bases, p.120-133, August 24-27, 1993](#)
- 12 [Jorma Rissanen, On equivalences of database schemes, Proceedings of the 1st ACM SIGACT-SIGMOD symposium on Principles of database systems, March 29-31, 1982, Los Angeles, California](#)

## ↑ CITINGS

[Christophe Nicolle , Kokou Yélongnon, XML-based toolkit for interoperability of web information systems, Web-enabled systems integration: practices and challenges, Idea Group Publishing, Hershey, PA, 2003](#)

## ↑ INDEX TERMS

### Primary Classification:

H. Information Systems

↪ H.2 DATABASE MANAGEMENT

### Additional Classification:

H. Information Systems

## ↪ **H.2 DATABASE MANAGEMENT**

### ↪ **H.2.1 Logical Design**

↪ **Subjects:** Data models; Schema and subschema

#### **General Terms:**

Design, Management, Performance, Theory

#### ↑ **Collaborative Colleagues:**

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